

FIG. 1

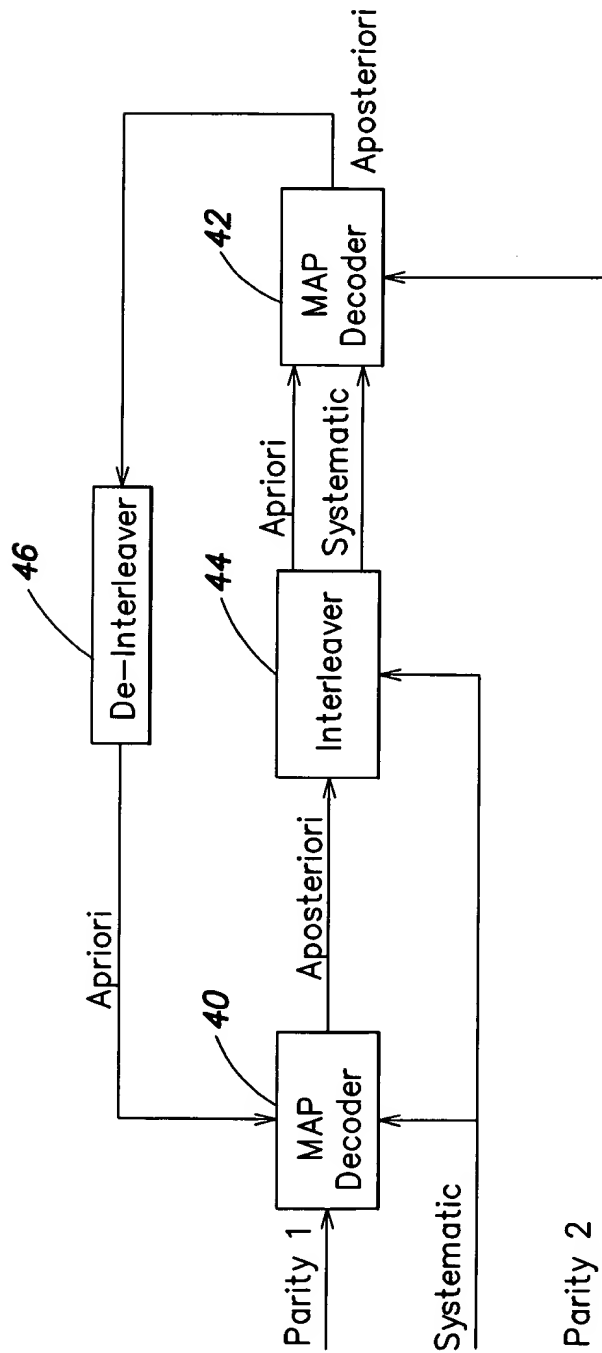


FIG. 2

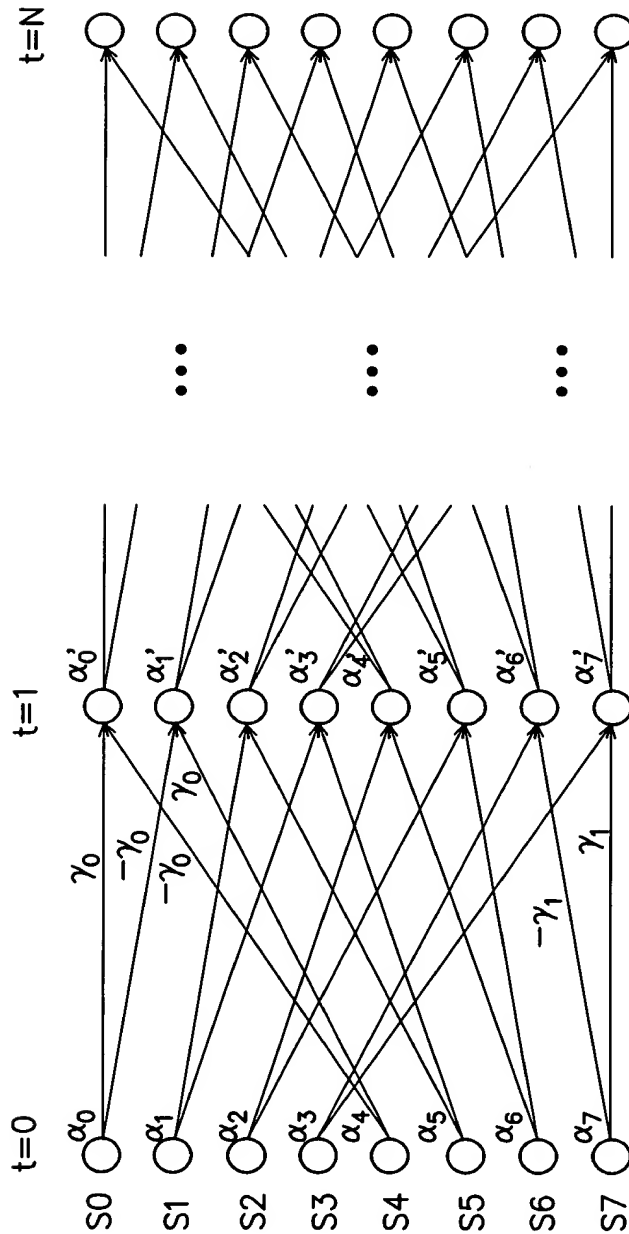
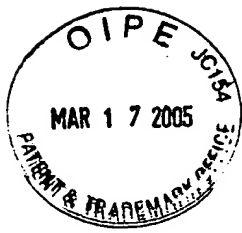


FIG. 3



$$\begin{aligned} \text{Ln}[\alpha_k(S)] = \text{MAX} \{ & \text{Ln}[\alpha_{k-1}(S')] + \text{Ln}[\gamma_k(S', S)] , \\ & \text{Ln}[\alpha_{k-1}(S'')] - \text{Ln}[\gamma_k(S', S)] \} \\ & + \text{Ln}[1 + e^{-\text{abs}(\text{Ln}[\alpha_{k-1}(S') - \text{Ln}[\alpha_{k-1}(S'')])}] \end{aligned}$$

**FIG. 4**

$$\begin{aligned} \text{Ln}[\beta_{k-1}(S)] = \text{MAX} \{ & \text{Ln}[\beta_k(S')] + \text{Ln}[\gamma_k(S', S)] , \\ & \text{Ln}[\beta_k(S'')] - \text{Ln}[\gamma_k(S', S)] \} \\ & + \text{Ln}[1 + e^{-\text{abs}(\text{Ln}[\beta_k(S') - \text{Ln}[\beta_k(S'')])}] \end{aligned}$$

**FIG. 5**

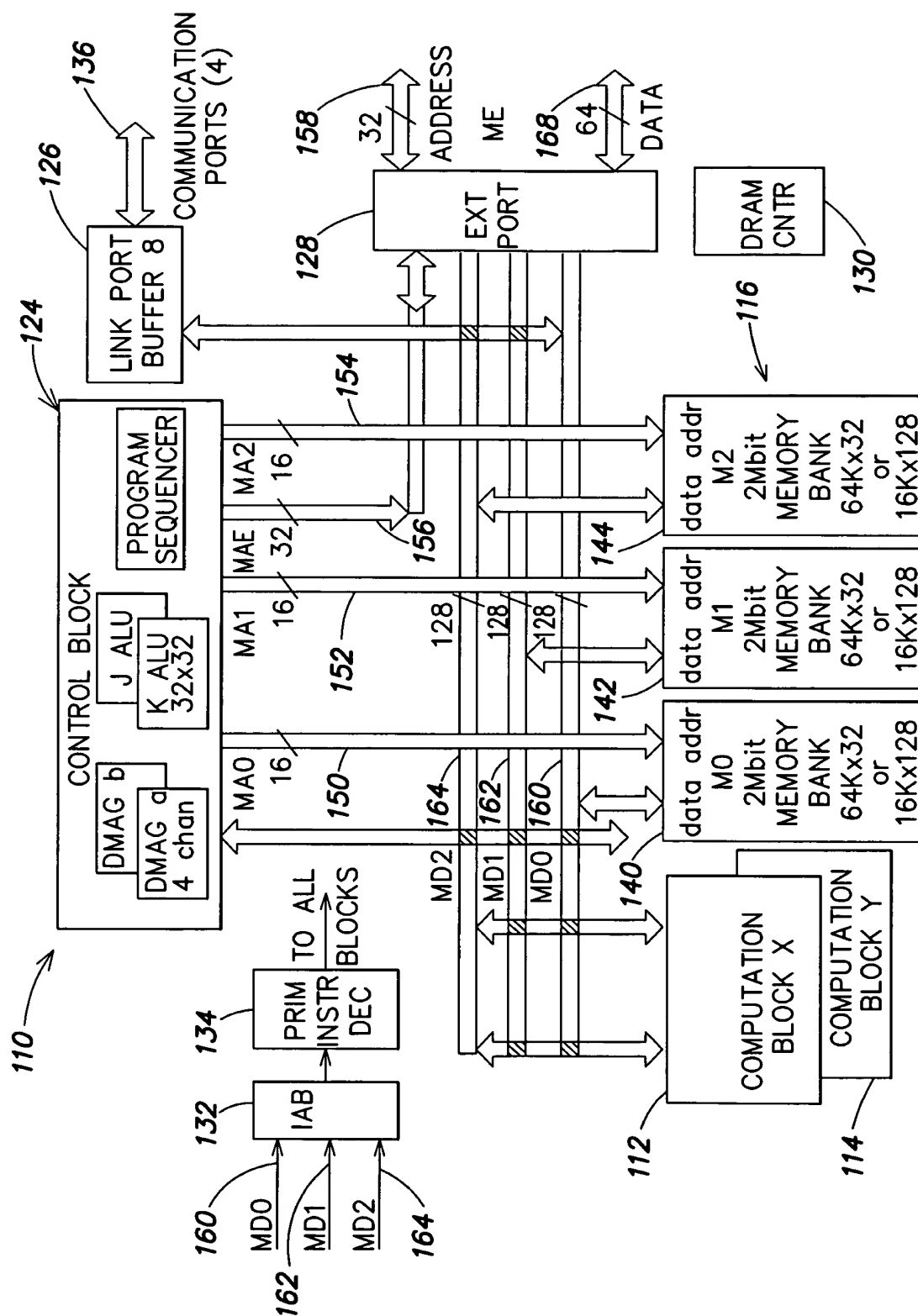
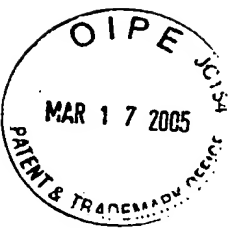


High Performance Turbo and Viterbi  
Channel Decoding in Digital Signal  
Processors  
Stephen J. Plante  
Serial No.: 09/923,225  
Docket No.: A0312.70410US00

Replacement Sheet

$$\begin{aligned} \text{LLR}(k) = & \text{Max}_{S^+} \{ \ln[\alpha(S_{k-1})] + \ln[\gamma(S', S)] + \ln[\beta(S_k)] \} \\ & - \text{Max}_{S^-} \{ \ln[\alpha(S_{k-1})] + \ln[\gamma(S', S)] + \ln[\beta(S_k)] \} \\ & + \text{Jacobian Correction Factor} \end{aligned}$$

**FIG. 6**



**FIG. 7**

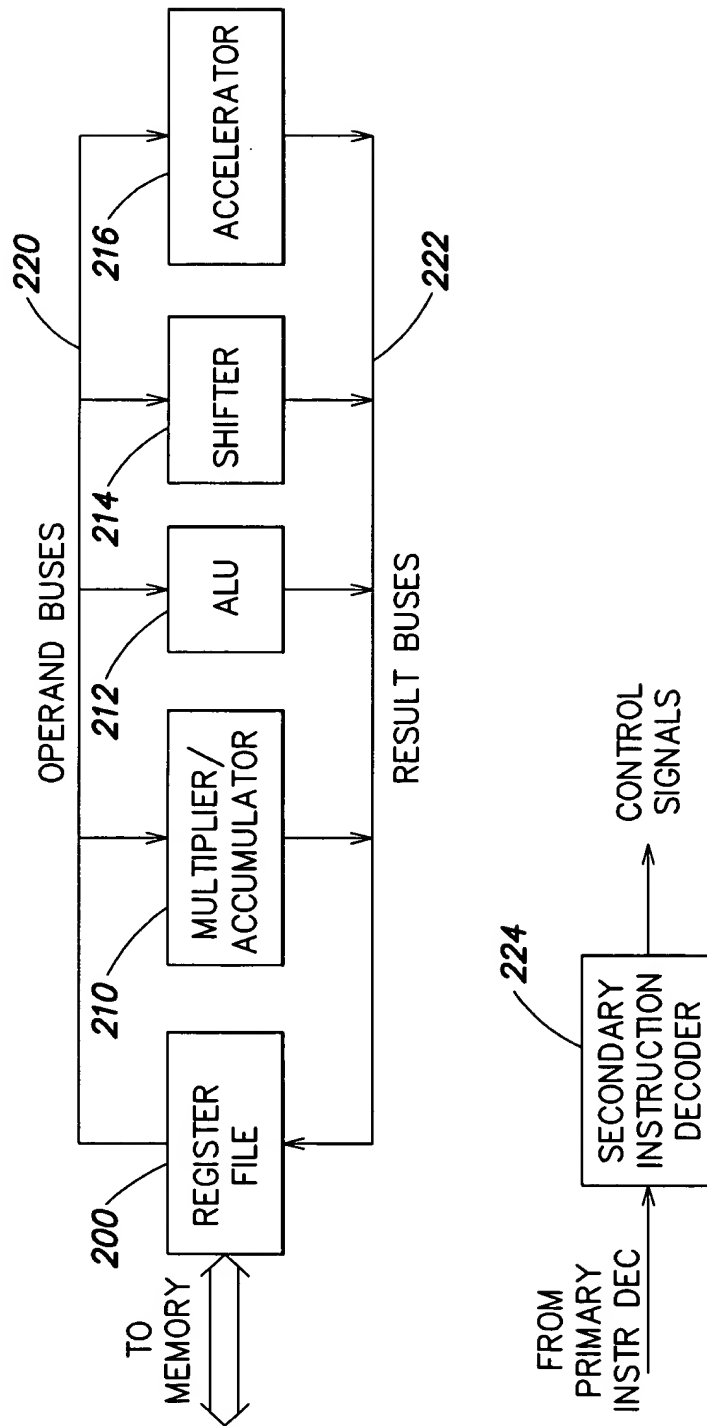
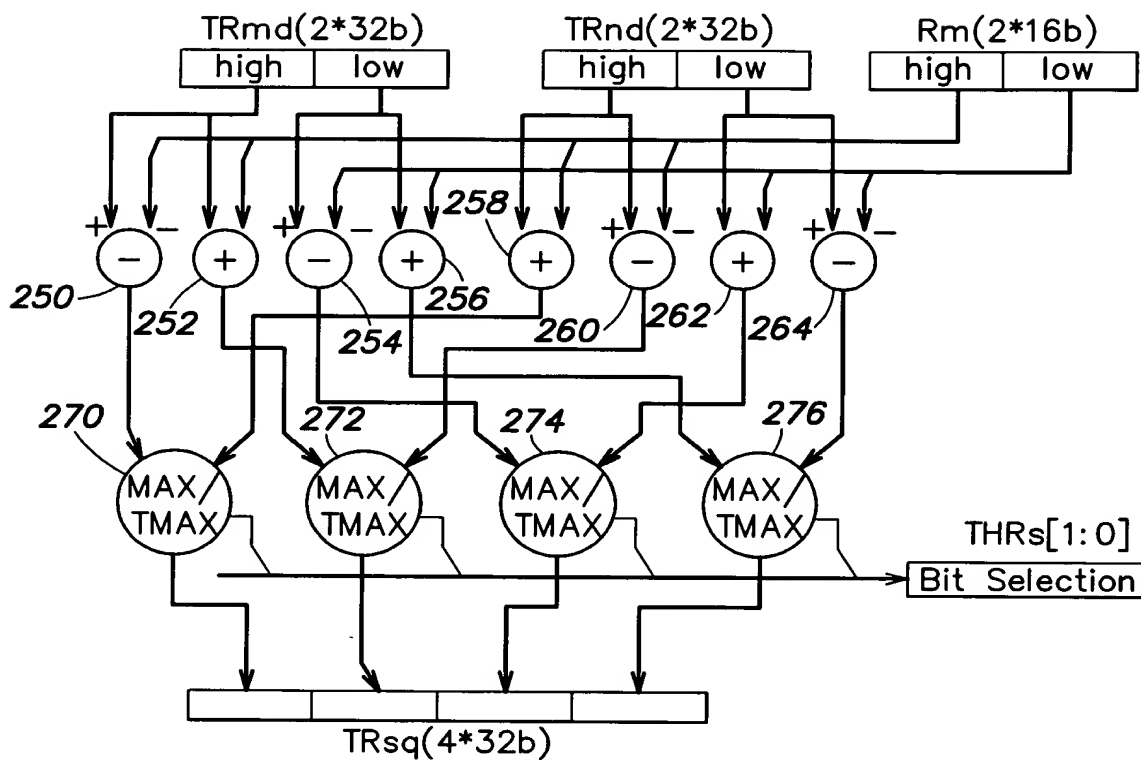
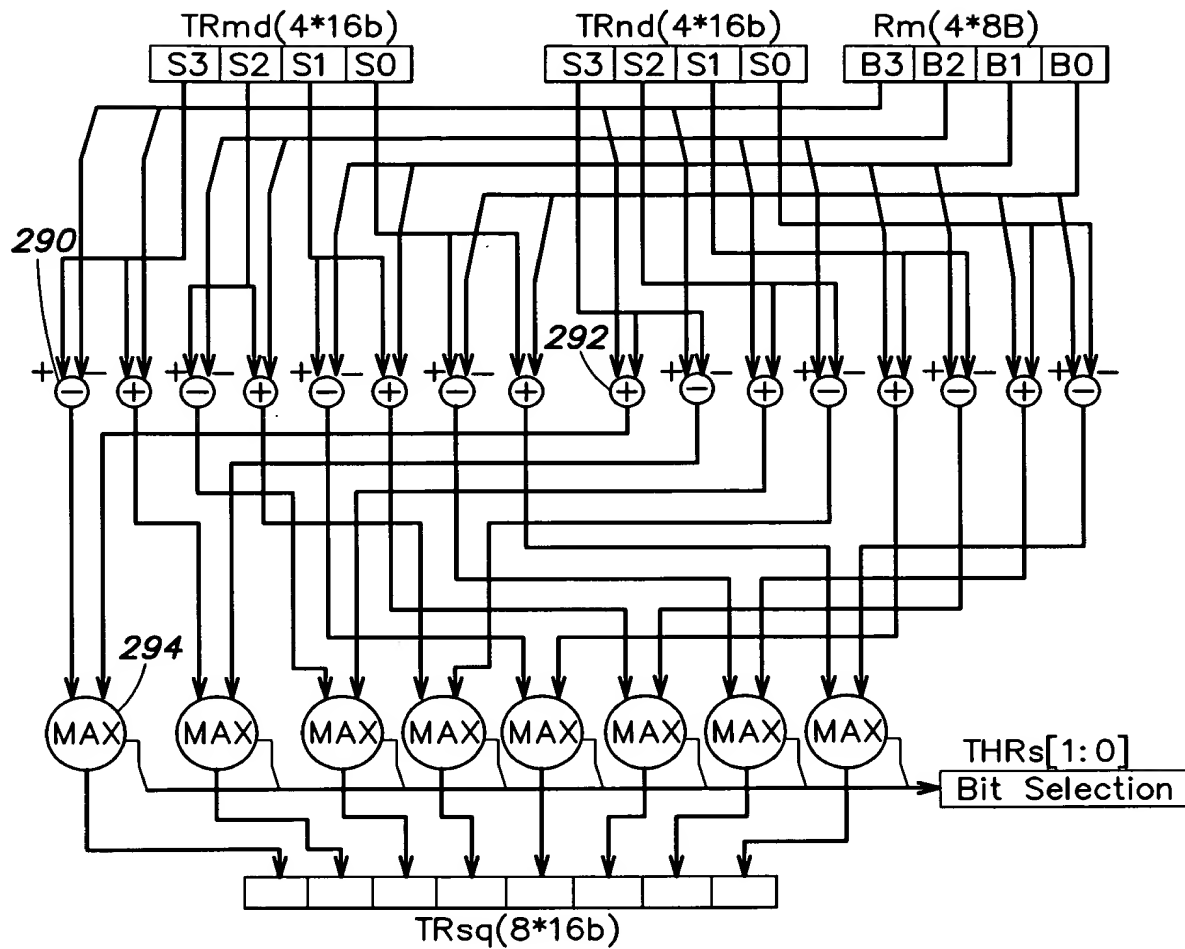


FIG. 8



**FIG. 9**





**FIG. 10**



```
LOOP:
R7:4  =TR7:4, TR11:8  = ACS(TR5:4, TR1:0, sR24); q[K22+=4]=xR3:0; q[J22-=4]=yR3:0;;
R11:8 =TR11:8, TR15:12 = ACS(TR7:6, TR3:2, sR25); q[K22+=4]=xR7:4; q[J22-=4]=yR7:4;;

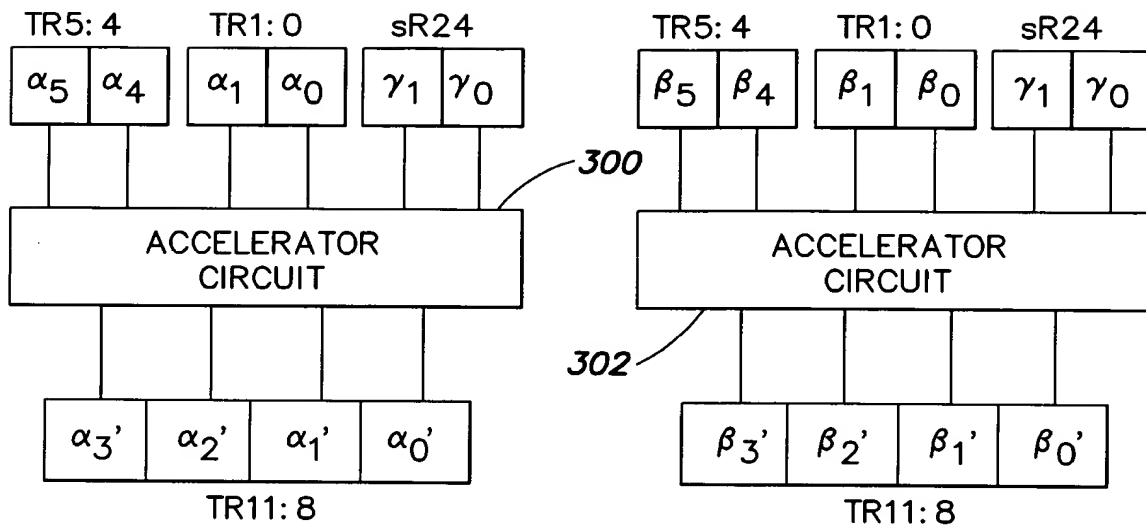
R15:12=TR15:12,TR3:0  = ACS(TR13:12,TR9:8, sR26); q[K22+=4]=xR11:8; q[J22-=4]=yR11:8;;
R3:0  =TR3:0, TR7:4  = ACS(TR15:14,TR11:10,sR27);q[K22+=4]=xR15:12;q[J22-=4]=yR15:12;;

R7:4  =TR7:4, TR11:8  = ACS(TR5:4, TR1:0, sR28); q[K22+=4]=xR3:0; q[J22-=4]=yR3:0;;
R11:8 =TR11:8, TR15:12 = ACS(TR7:6, TR3:2, sR29); q[K22+=4]=xR7:4; q[J22-=4]=yR7:4;;

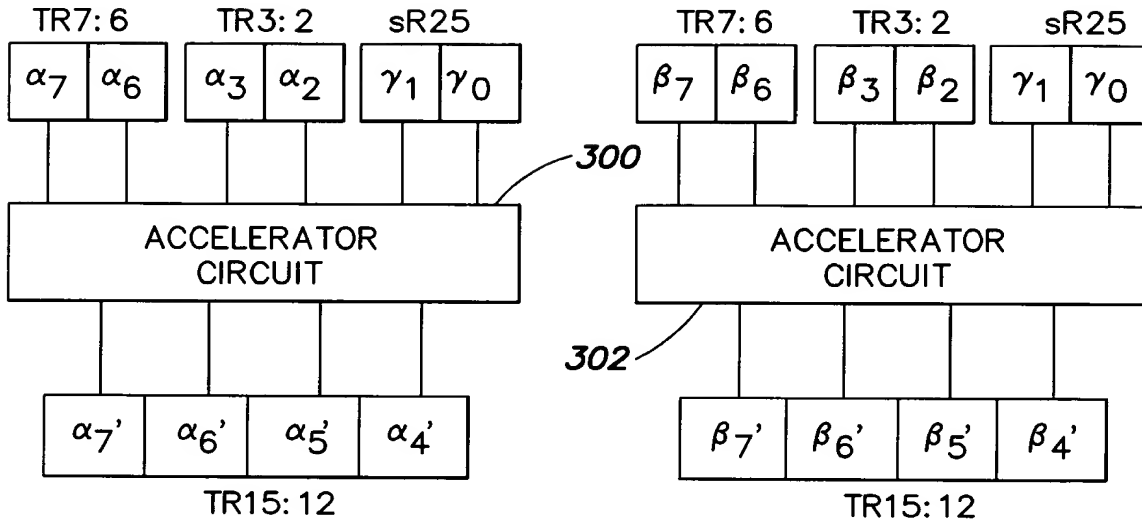
R15:12=TR15:12,TR3:0  = ACS(TR13:12,TR9:8, sR30); q[K22+=4]=xR11:8; q[J22-=4]=yR11:8;;
R3:0  =TR3:0, TR7:4  = ACS(TR15:14,TR11:10,sR31);q[K22+=4]=xR15:12;q[J22-=4]=yR15:12;;

If nLCOE, jump loop;;
```

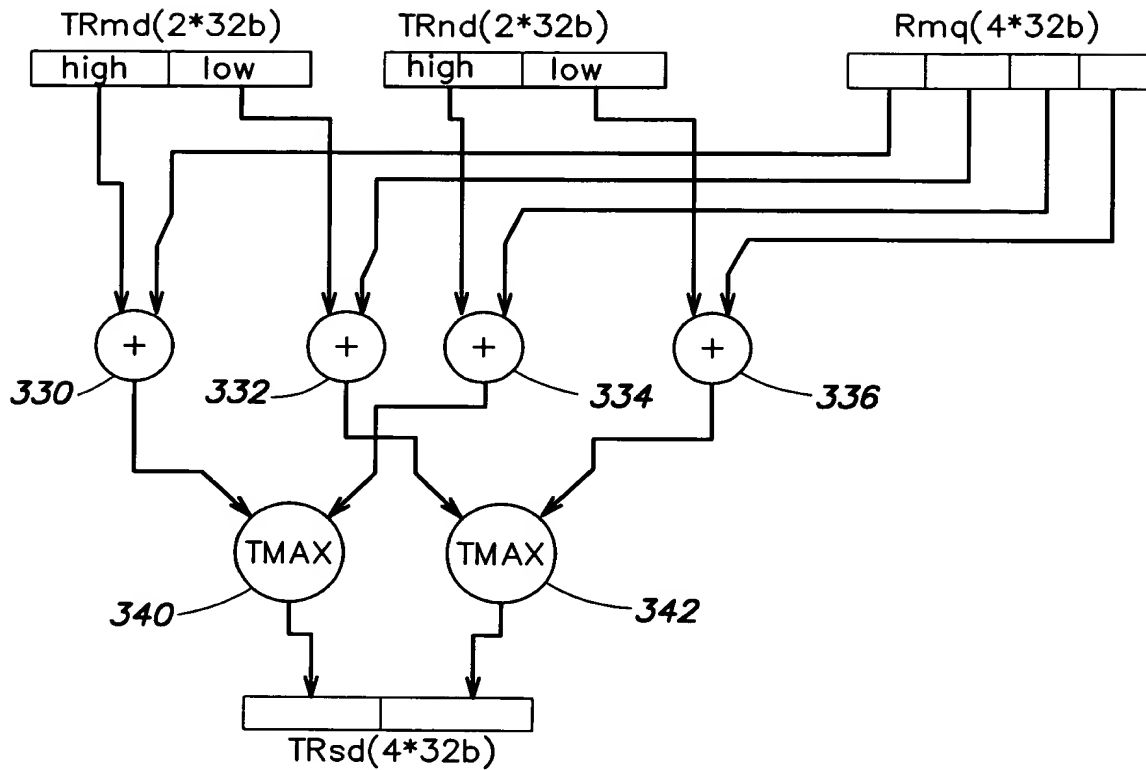
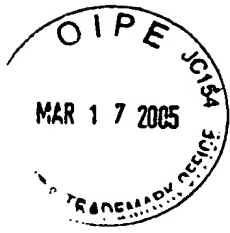
FIG. 11



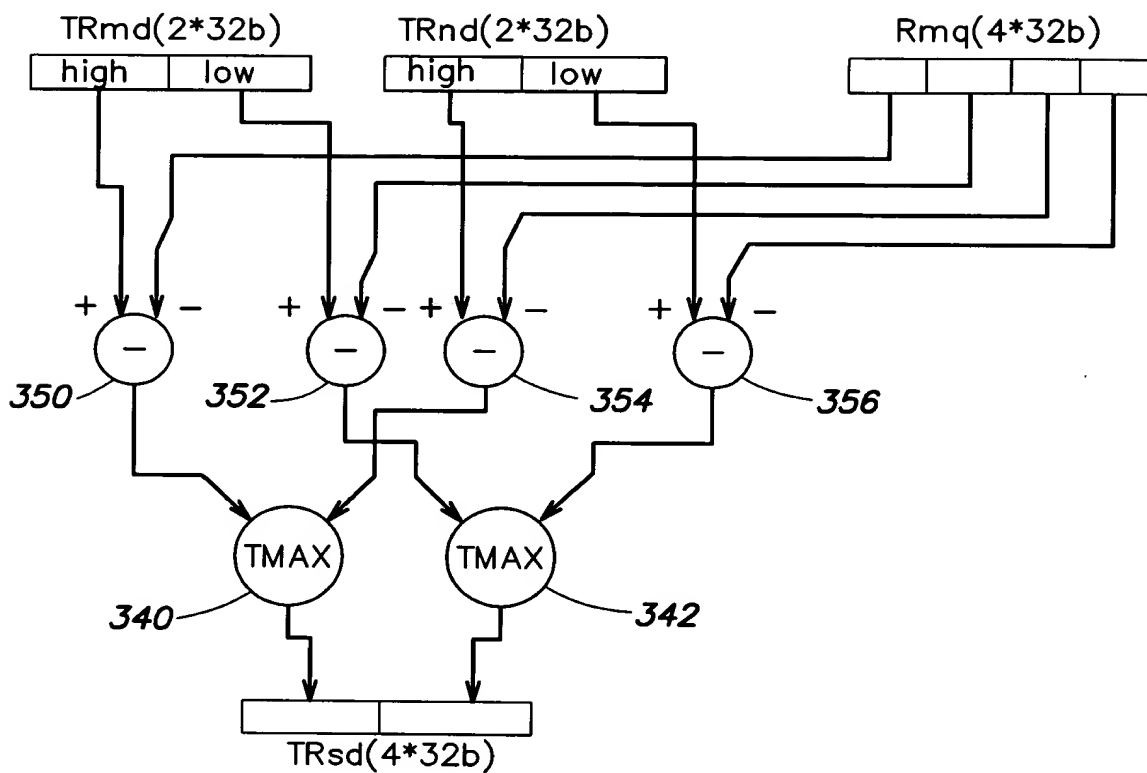
**FIG. 12**



**FIG. 13**



**FIG. 14**



**FIG. 15**



High Performance Turbo and Viterbi  
Channel Decoding in Digital Signal  
Processors  
Stephen J. Plante  
Serial No.: 09/923,225  
Docket No.: A0312.70410US00

Replacement Sheet

//ADD Alpha + Betas for 0 and 1 State Changes  
TR9:8 = TMAX(TR1:0 + R9:8, TR3:2 + R11:10);;  
TR11:10 = TMAX(TR1:0 + R13:12, TR3:2 + R15:14);;  
TR13:12 = TMAX(TR5:4 + R13:12, TR7:6 + R15:14);;  
TR15:14 = TMAX(TR5:4 + R9:8, TR7:6 + R11:10);;

//ADD Gamma for 0 and 1 State Changes  
TR5:4 = TMAX(TR9:8 + R0:0, TR13:12 + R1:1);;  
TR12:11 = TMAX(TR11:10 - R0:0, TR15:14 - R1:1);;  
R0 = TMAX(TR5, TR4);;  
R1 = TMAX(TR12, TR11);;  
R0 = R1 - R0;;

FIG. 16

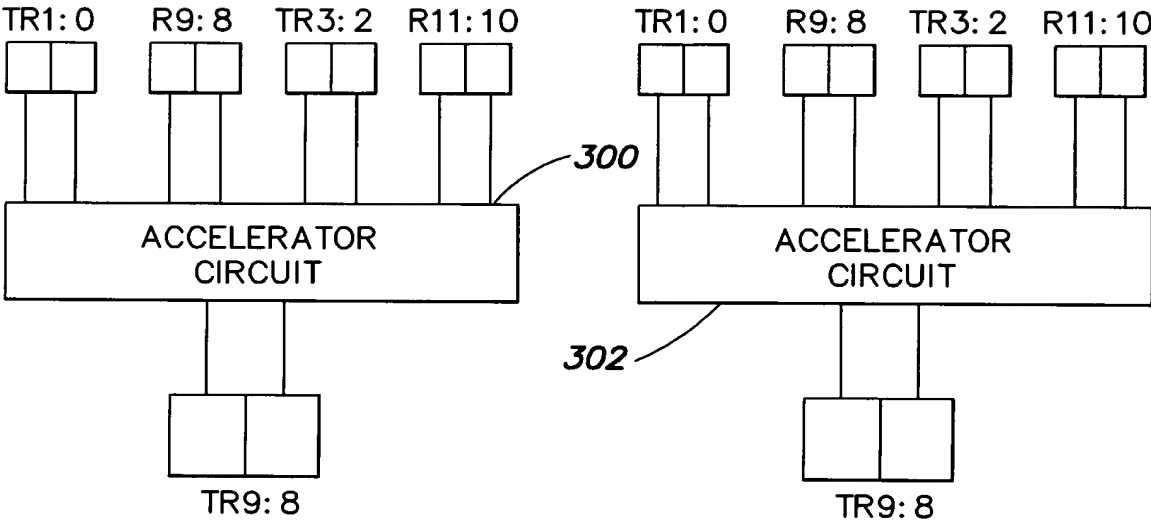
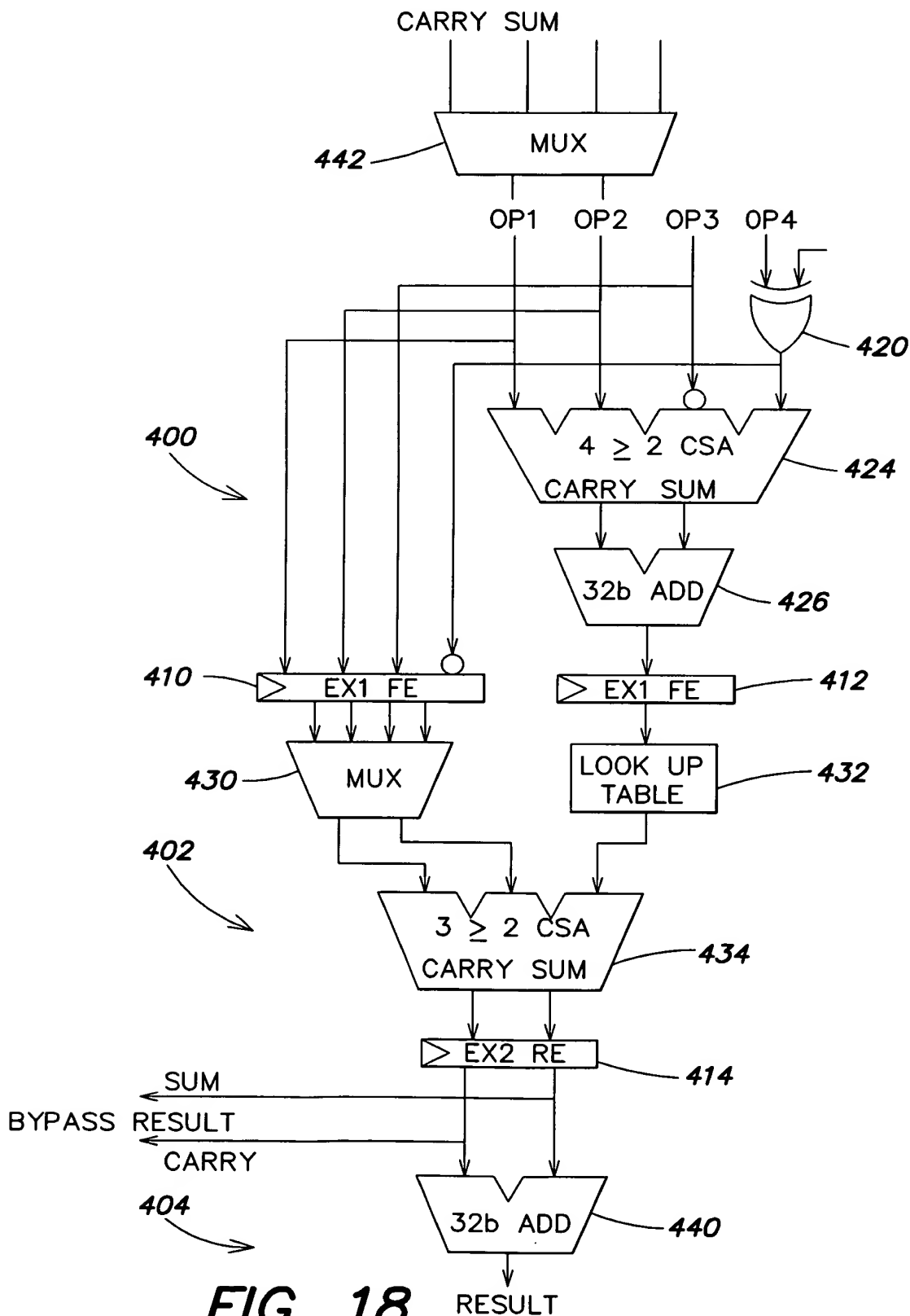


FIG. 17





**FIG. 18**